N.A.C.A. BULLETIN

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ACCOUNTING FOR GOVERNMENT CONTRACTS UNDER THE ARMED SERVICES PROCUREMENT REGULATIONS

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Although portions of the new procurement regulations of the armed services are still in process of development, Section VII, covering Contract Forms and Provisions, has been given tentative form, and Section XV, comprising a Statement of Contract Cost Principles, has been published and is in effect. It is with the implications of these sections that the present article primarily deals. Comments on existing profit limitation legislation are also included.

WHEN we talk about government contracts we mean military contracts. When we talk about military contracts we mean industrial mobilization. In preparation for business mobilization what more essential requirement is there than an advance study of the medium through which government procurement is controlled, namely, the supply contract?

Significance of New Procurement Regulations

The last twelve months have seen a great deal of careful preliminary work of a technical, legal, and accounting nature on contract procedure by the armed services. This work has taken the form of regulations known as the Armed Services Procurement Regulations issued by the Munitions Board. Eighteen topical sections have been assigned. Some of these are still in draft form and are being coordinated within the armed services and with industry. Some have been adopted. Others have not yet reached draft form. The sections cover such features as procurement by advertising, procurement by negotiation, foreign purchases, termination, patents, taxes, labor, government furnished property, inspection, etc. The most interesting to accountants are doubtless the sections dealing with Contract Forms and Provisions, Section VII, and the Statement of Contract Cost Principles, Section XV. The first of these is undergoing industry examination at the present time. The second has been adopted and printed, and became effective on March 1, 1949.

What is the significance of these regulations as such? In my opinion, they represent an expression of a policy characterized by foresight and a firm desire to capitalize on the experience and mistakes of the last war, to the end that ambiguity and uncertainties in contract dealings are minimized and that a suitable balance will be maintained between the protection of the interest of the government and fairness to the individual contractor.

When we think of cost accounting under government contracts our concept of this branch of accounting must be kept on the broadest possible basis. It will embrace all the financial and administrative accounting functions not normally associated with product cost. It will be the responsibility of the cost accounting function to estimate and accumulate all legally admissible costs—strictly construed—remembering that in a situation of large military production, industry finds itself subjected to a single customer monopoly, with no opportunity for ordinary commercial activity to supply revenues against which to charge errors in costing judgment. The marshalling of incurred costs for prompt reimbursement, the avoidance of disputes over allowable and unallowable costs, the efficiency of internal operations, the basis of financing production under supply contracts (for which a company's normal capital supply is usually inadequate), the accounting for use of facilities, the selection of the proper contract form, all invoke our broadened concept of cost accounting such as it would necessarily be in a wartime economy.

When and if mobilization occurs, the principles of cost accounting will play a dominant role. The direct and indirect demands which will be made on the internal accountant (and often on the independent accountant) will be endless. The necessity for this can be readily understood by examining those provisions of the regulations which control, limit, or otherwise influence the price of a product or the return to the producer where government contracts are involved. Our source for these is found in the tentative Section VII, Contract Forms and Provisions, mentioned above. It is from this section that all the standard contract language must be drawn.

Existing Profit Limitation Legislation

It may be well not to go too far into discussion of procurement regulation provisions without at least making mention of profit limitations legislation. Here we note the existence of the Vinson-

Trammel Act and the Renegotiation Act of 1948. Clauses evidencing the applicability of these Acts must be incorporated in all supply contracts where appropriate. The coverage of the Renegotiation Act is practically limited at the present time to contracts for construction and procurement of aircraft and spares, although it may be expanded to cover ships and some construction of facilities. The Vinson Act applies to any contract for more than $10,000 for construction of complete naval vessels or aircraft. The side-by-side existence of the two profit-limiting acts is a situation not encountered in the last war, when the Vinson Act was suspended during the period of the excess-profits tax, a period which virtually spanned the entire period of renegotiation.

Both the Vinson Act and the Renegotiation Act are directed at profits from contracts based on government procurement although their approaches are different. The Vinson Act provides for fixed percentage limitations on profits while the Renegotiation Act is flexible on that score. The Vinson Act applies to the total contract price of contracts completed during a fiscal year, while the Renegotiation Act applies to aggregate receipts or accruals during a taxable year. The Vinson Act provides for carry-over of losses and in the case of aircraft it provides a carry-over of deficiency in profit under twelve per cent. There is no carry-over provision under renegotiation. Unless the Vinson Act is repealed, it is possible that the enforcing agencies will conflict. There seems to be no need of both acts in government contract regulation at this time.

The regulations to be promulgated for the Renegotiation Act of 1948 should be of interest to accountants. Those contracts which would otherwise be renegotiable must reflect aggregate receipts or accruals of over $100,000 for the contractor in question for any one fiscal year before they may be renegotiated, whereas under prior law the starting point was $500,000.

Price Redetermination Under the Procurement Regulations

Next in the order of general contract provisions which should be of greatest interest to prospective contractors and their accountants is the matter of price redetermination. The regulations present a series of alternatives which afford every opportunity to the contractor in his consideration of the forms best suited to his protection. Actually there are eight distinct forms of price redetermination offered. A few will be mentioned, so that the variety of

conditions allowed for and the pattern of application may be seen.

One form provides for periodic *prospective* upward or downward redetermination of price at fixed intervals or quantities. Both parties are bound by the price for the initial period. This initial price is based on projections not extending beyond the end of the first period. A second form is essentially the same as the first except that the redetermination is made only if either party demands it. A third type provides for *retroactive* upward or downward redetermination of price upon demand of either party. A fourth type specifies a downward redetermination of total contract price at a fixed point and a forward price for the remainder of the contract based on costs to be incurred. Another form permits the adjustment of prices either up or down upon the happening of a specified contingency. Included in such contingencies would be the instance of price fixing or supply controls by the government or failure of a contractor to comply with contract conditions or deliveries because of an act of the government.

Thus can be seen the great inherent benefits to a contractor in being able to adapt these various formulae to his own advantage, but it is equally clear that no haphazard system of accounts or records could ever produce the data essential to advantageous operation under such price redetermination clauses. In fact, it is specifically stated in the regulations that price redetermination cannot be employed if the contractor does not use acceptable estimating methods and if his cost accounting system is not sufficiently reliable and accurate.

In connection with price redetermination the use of escalation articles will be predicated on the assumption that it is to the best interests of the government to negotiate for the inclusion of such an article in return for a price concession by the supplier. Escalation is usually utilized in the case of prices for standard or "off-the-shelf" articles which normally lend themselves to sale at firm prices. The government would look to escalation to protect itself in the case of a falling market but, as far as the contractor is concerned, wherever the article requires cost estimating, it would be to his interest to negotiate for price redetermination rather than escalation.

Incentive Type Price Redetermination Methods

The regulations governing general contract provisions have extended the price redetermination features to include those involv-

ing incentives, both for fixed price and cost-plus-fixed-fee contracts. A study of this feature is enlightening. The fixed price incentive type price redetermination contract provides for a redetermination of price after completion of the contract based upon the contractor's costs, determined by negotiation, plus a sliding scale of profit which varies inversely with the cost but which in no event shall permit the final price to exceed the maximum price stated in the contract. In addition, the formula for fixing the profit must be so scaled that an effective premium is afforded for reducing costs below the estimate and a deterrent provided to discourage the contractor from increasing costs. The contract price must be based on projections extending over the life of the entire contract, taking into consideration anticipated cost decreases, and no other redetermination of price or escalation provision may be used in the contract. The contract price becomes known as the "target." When actual costs exceed the target the amount and rate of profit are decreased. When the actual costs fall below the target, the amount and rate of profit are increased. In an actual contract of this type, the formula would work something like this:

> Assume the contract price is $100,000 per unit. The profit is set at six per cent or $6,000. The actual costs over the life of the contract average $80,000 per unit, a saving of $20,000 per unit. Eighty per cent of this saving, or $16,000, is passed on to the government by contract price change. The balance of $4,000 is retained as a performance bonus or incentive by the contractor. The total price to the government is $90,000 as compared with a target price of $106,000. The rate of profit earned by the contractor is increased from six per cent to approximately eleven per cent, on a cost saving of only fifteen per cent of the target price.

However, lest there by any thought that this opens the way for the contractor to realize an exorbitant rate of profit, it should be remembered that the Vinson Act and the Renegotiation Act are ready to come into play with their profit-limiting features.

The cost-plus-fixed fee incentive type price redetermination contract is essentially the same as with a fixed price plan, except that the sliding scale is applied to the fixed fee and only applies *upward*, that is, no deduction is made from the fee if the costs exceed the estimate. The effective rate of profit, or fee, however, is in fact reduced if the costs exceed the estimates.

Use of Predetermined or Provisional Overhead Rates

A further feature of the general contract provisions which is one of the most important of all from the standpoint of fair costing and the expeditious payment of incurred costs is the use of predetermined or provisional rates of overhead. This is a device which was not utilized in the last war to any extent. Predetermined or provisional overhead rates may be negotiated for inclusion in any cost or cost-plus-fixed-fee type of contract and may be subject to redetermination at fixed intervals. The use of either the fixed predetermined rate or the provisional rate revision article requires that the contract contain a definition of overhead which will prevent additional payments not contemplated in the negotiation. The rate used must be such that both parties shall be bound by the rate for the first period, except when a provisional rate is used. The fixed dates at which time redetermination will occur will be stated and the dates will conform with the contractor's accounting system, usually extending over six or twelve month intervals. The fixed rates will be negotiated prospectively.

It can be readily seen what great assistance this device will render in the rapid collection of overhead billings. After a rate is set by negotiation, it is not disturbed until the fixed interval expires. In the meantime the government inspectors have been examining the overhead accounts and computing a rate for adoption in the next period. The rate may be changed upward or downward but not retroactively. There is no bothersome argument over inadmissible overhead items. In fact, they become insignificant and it is possible that the rate may not be audited by the General Accounting Office, because it was determined by negotiation. The work of the government auditors is restricted to an examination of direct charges only and the delays in clearance of public vouchers are practically eliminated. Every effort should be made to adopt the use of predetermined overhead rates in cost-plus-fixed-fee contracts when offered. The basis for inclusion of items in overhead is determined by the Statement of Contract Cost Principles which will be discussed shortly.

Record-Keeping Requirements of the Procurement Regulations

We have sketched briefly some three or four subjects found in tentative Section VII of the Procurement Regulations. There are approximately sixty subjects in all. Many of them are the responsibility of the accounting department. Before leaving this

section, it would be interesting to read from the subsection on Accounting Methods and Records:

> "All cost and cost-plus-fixed-fee contracts *must* contain this provision. The contractor agrees to keep records and books of account, showing the *actual* cost to him of all items of labor, materials, equipment, supplies, services, and other expenditures, of whatever nature, for which reimbursement is authorized under the provisions of this contract. The method of accounting shall be subject to the approval of the contracting officer; Provided, no material change will be required therein if it conforms to good accounting practice and the costs are readily ascertainable therefrom."

There is more to this subsection, but the foregoing seems sufficient to establish the burden on the contractor to maintain proper records. All contracts which call for the furnishing or construction of aircraft, aircraft parts, or aeronautical accessories, and all cost and cost-plus-fixed-fee contracts, regardless of the type of supplies or services, must contain a provision that the contractor's books and records and his plant or such parts thereof as may be engaged in the performance of the contract, shall at all reasonable times be subject to inspection and audit by any authorized representative of the government. The same applies to subcontracts. There is nothing new in this, although it is not known at this time to what extent the audit of contracts will be coordinated within the services. There are indications that overlapping auditing will be done away with.

Statement of Contract Cost Principles

As mentioned before, the second instance of the thorough preparatory work performed by the armed services is found in the Statement of Contract Cost Principles, which is Section XV of the Procurement Regulations. This was in the making for over a year and was finally printed and became effective on March 1, 1949. The statement of contract cost principles is intended to be used by the departments of the armed services in order to establish for those departments uniform policies relating to the determination of costs having to do with procurement of supplies and services. The outlines of the statement are not unlike those of the Explanation of Principles for Determination of Costs Under Government Contracts (the familiar "green book") in use during

the war. There are important differences, however. The green book was never formally adopted by the armed services, although it was used and referred to by government agencies and sometimes written into contracts. The current statement is very clear as to its application. It states that in order for the principles for determination of costs outlined therein to be binding on the government and a contractor, the applicable principles must be set forth in the contract or appended thereto or incorporated by reference. It adds that, on and after the effective date of March 1, 1949, *these cost principles shall be made a part of every contract of the type to which they apply.*

The category of contracts to which the contract cost principles apply are identified as contracts of the cost-reimbursement type. Contracts of this type include cost or cost-sharing contracts, cost-plus-fixed-fee contracts, and the cost-reimbursement portion of time-and-materials contracts. Separate provisions are furnished within the section for contracts with commercial companies, nonprofit institutions, and construction contracts.

As a corollary to the authoritative position now occupied by the statement of contract cost principles, it might well be asked whether flexibility has been sacrificed. Actually it appears that some provision against such sacrifice has been made. One means is by the use of explanatory cost interpretations which presumably will have the same force as the original statement. Some of these are actually in preparation now. The other means is found in the statement itself which devotes a separate section to subjects affecting cost which may require special consideration in connection with the negotiation or performance of cost-reimbursement type contracts.

The statement actually contains a check list of examples illustrative of such special subjects and directs the contracting officers and their negotiators to see to it that special subjects are studied and appropriate clauses incorporated. Thus the contractor has an opportunity to insure that unusual circumstances in his particular case are dealt with in the contract and that the specific principles in the statement are adapted to his situation as much as possible. If contractors avail themselves of these rights to incorporate unusual subjects and if careful study is given the explanatory cost interpretations, it would seem that serious detriment to the interest either of the government or the contractor can be avoided.

The statement has one further important application, in that in the case of contracts having predetermined overhead rates the principles are to be used only as a basis for negotiating such rates.

Allowable and Unallowable Costs

Essentially the statement of contract cost principles establishes the meaning of costs in the eyes of the government. Unlike the business concept, which treats practically every expenditure as a determinant of total costs, the government concept is that costs are comprised of two classes, allowable and unallowable. The former are reimbursable. The latter are not. The contractor is left to his own devices to recover unallowable costs through income, capital, or some form of tax benefit. Since this divergence in concept is so clearly drawn in the statement of contract cost principles, a most careful study is in order. Our experience in the last war is invaluable in this respect as the outline of allowable and unallowable costs follows closely the previous pattern.

The statement provides a general basis for determination of costs by stating that the total cost of a contract is the sum of the allowable direct costs incident to the performance of the contract, plus the properly allocable portion of allowable indirect costs, less applicable income and other credits. The tests used in determining the allowability of costs also include reasonableness, application of generally acceptable accounting principles and practices, and any limitations as to types or amount of costs specifically set out in the statement. Failure to mention any particular item of cost in the statement does not imply that it is either allowable or unallowable. The use of normal or standard costs (with appropriate adjustment for variances, unallowable costs, and other specific exclusions) is acceptable in determining amounts of provisional or interim payments, but final allowable costs must represent actual costs.

Direct Costs

Allowable costs are classified in the statement between direct and indirect. Direct costs include, of course, materials and labor but also admit an unclassified group of charges described as other direct costs. The definition of direct materials seems to be fair. It embraces the cost of all items purchased, supplied, manufactured or fabricated, which enter directly into the end product or

which are used or consumed directly in connection with furnishing such product. Consideration will be given to reasonable overruns, spoilage, and defective work. Withdrawals from a contractor's stock will be charged in accordance with the pricing system used by the contractor, provided such system is in accordance with sound accounting practice and is consistently followed. Adjustments of book records to physical inventories will be allowed in arriving at cost of materials, provided no mere valuation write-downs are included and the adjustments are applicable to the period of the contract. Credits arising from periodic physical inventories must be taken into account. The cost of materials must reflect deduction of all discounts, rebates or allowances, and credits for returned material and scrap, whether or not the latter is sold.

The rules governing labor charges are orthodox and clear. Direct labor cost consists of salaries and wages properly chargeable directly to the performance of the contract. Actual salary and wage rates will generally be used but average rates are permissible if this is the contractor's practice and the government is not prejudiced thereby.

Indirect Costs

For accounting purposes, indirect costs are classified in the usual manner, namely,

1. Manufacturing and production expenses.
2. Selling and distribution expenses.
3. General and administrative expenses.

The principal problem encountered here is the matter of apportionment of indirect costs and the regulations state that the method of apportionment must be equitable. They also state that whenever items ordinarily chargeable as indirect costs are charged to a government contract as direct costs, the cost of similar items applicable to other work of the contractor must be eliminated from indirect costs apportioned to the contract. Regardless of their treatment as direct or indirect, all costs must pass the classification test as to allowability, although naturally most of the unallowable items would be of the indirect type. A discussion of a few examples of allowable or unallowable cost would be of particular interest.

Compensation of Officers; Depreciation; Taxes

Compensation of corporate officers, executives, and department heads is allowable within limitations. The term "compensation" includes all amounts paid or set aside, such as salaries, royalties, bonuses, and pension, retirement and deferred compensation benefits. The total compensation of an individual may be questioned and the amounts allowed may be limited. In determining this, consideration will be given to the relation of the total compensation to the services rendered.

Depreciation and depletion expenses are allowable when based on cost of acquisition, but depreciation or amortization on unrealized appreciation in value of fixed assets is not. Depreciation on fully depreciated or amortized assets and on excess facilities is not allowable. However, among the special subjects which may be negotiated into a contract we find that consideration may be given to plant facilities fully depreciated or amortized on the contractor's books of account or acquired without cost, with possible compensation for utilization, in the form of a use or rental charge. Prospective contractors would do well to examine their accounts and records carefully to be sure whether they wish to make such claims in lieu of depreciation and whether they have enough evidence to satisfy a contracting officer or procurement official that their claims are well justified. They should also be careful that no facilities marked as excess are actually stand-by or provisional facilities.

The statement is unequivocal with respect to taxes. On commercial contracts the list of allowable costs simply shows the word "taxes." On the unallowable list we find the items "Federal taxes on income and excess profits" and "taxes and expenses in connection with financing and security transactions." Thus it would appear that the annoying problem so prevalent during the last war of having to classify taxes between income and excise taxes is now avoided. It seems fair to interpret the present rule as allowing taxes of whatever nature except the two specific types named.

Contributions and Donations; Insurance

As to contributions and donations, the statement simply excludes all such expenses from allowable costs. The same is almost true of advertising which, as an allowable cost, is now limited to advertisements for recruiting help and advertising extended as a flat subsidy to a technical or trade journal.

Self-insurance is includible in allowable costs, but it is to be presumed that the allowances would have to bear some reasonable relation to the cost of insurance purchased on the outside. The statement does not show what types of risk may be covered. In the "green book" only self-insurance for workmen's compensation was admissible. Other self-insured risks were allowable only as actual losses occurred. The costs of pension, retirement, group health, accident and life insurance plans (except premiums on officers' insurance where the contractor is the beneficiary) are allowable. This principle was not applied so broadly during the war.

Opportunity for Prospective Contractors to Study Principles

It would be unnecessary at this time to continue commenting on the numerous interesting and important items in the statement of contract cost principles. A study of the statement will, I am sure, convey the impression that its clear and well written provisions evidence an unmistakable intention to deal fairly with a contractor. And, in a larger sense, it seems equally clear that the excellent preparatory work accomplished by the armed services to date in establishing the rules under which contractors must work with their government will be ineffective if the opportunity now presented for studying those rules is lost.

COMING ARTICLES

In the *N. A. C. A. Bulletin*, May 15, 1949

Providing a Standard Pricing Base to Promote Corrective Action in Product Pricing Policies
by Allen H. Ottman

An Identified Materials Procedure for Production and Inventory Control in a Steel Rolling Mill
by Milton B. Frohn

Continuous Review and Revision of Forms, Methods, and Procedures
by Lawrence P. Jennings

SHARING DEPARTMENTAL COST SAVINGS AND OVER-ALL PLANT PROFIT WITH SUPERVISORY PERSONNEL

by ARTHUR B. WINTER

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The difficulties always encountered in establishing a relationship for financial incentive purposes between the efforts of production department supervisors and operating results in their respective departments and in the plant as a whole are here solved on a practical basis, in terms of a plan suited to the company whose experience provides the material for this article. Nonproductive supervisory personnel, whose inclusion in bonus arrangements ordinarily offers still further complications, are also made participants in over-all plant profit.

HUNDREDS of profit sharing systems have been developed and put into operation within industry in the last few decades. For purposes of this paper we are interested in those directed to stimulating the efforts of supervisory personnel. The gamut runs all the way from a split of a "melon," which amount has been determined in any one of a thousand ways, from complicated scientific setups tied into a cost of living index or other economic factors, to simple arbitrary percentages of operating profit. There have been systems which paid a share of profits to supervisors in production departments only. Other methods have been developed for all shop supervision on an equal basis. No system has satisfied all possible participants and no system can! For this and other reasons, there are still many members of management who refuse to believe that profit sharing or "bonuses" should be part of compensation at all and few of those who participate in more complicated plans fully understand the significant philosophy of the plans or how they operate.

Many plants employ instead the device of job evaluation for foremen, superintendents, plant managers, etc., with definite salary ranges for jobs at various levels. Other organizations have had top-notch people in charge of departments and have paid them

very large salaries when business has been better than normal. However, when production levelled off or depressions loomed in the offing, drastic pay cuts resulted and in many cases valuable personnel separated themselves from the organization. There is plainly a real place for profit sharing wherever it can be practicably applied.

Purposes Served by Profit Sharing

One purpose of profit sharing is the easily understood one of helping directly to increase profits. Business works at the present time on a very narrow profit margin. With high labor rates prevalent throughout the country, with increased costs of material and supplies, and with the possibility of stiff excess profits taxes, business *must* produce at a smaller per unit cost if it is to survive. Members of management are human and most of them give more than an honest return for each dollar they are paid. However, if a superintendent receives a fair salary and also a chance to share in the profits which he helps to make for industry, it is only human nature that he will strive with more than normal effort to secure some of this gain.

Profit sharing creates a better feeling within the management group. Unless the individuals in this group are in harmony, the ultimate goal of greater production at lower cost will not be achieved. Management personnel in industry are, generally speaking, tied down to a more or less stable salary. Profit sharing compensates individuals for extra effort and longer hours in the plant and may also be used to cushion the effect of increased living costs and the shrinking value of the dollar. It allows top management to stabilize wage levels for the management group to a certain extent and yet give its members a greater take-home pay when business is good and production is heavy.

Profit sharing likewise has for its purpose the reduction of costs and a closer control of cost figures. Too often a production manager is known to be an expert in ways and means of producing and yet he has no conception of costs in the way the cost accountant understands them. Often he has no particular desire to know about costs and less concern over the necessary paper work that must go through his department. Industry today with all its complexities cannot survive without paper work

and, though some may question this, the author firmly believes that any business which is in competition with others is only as good as its cost controls and paper work can make it.

If faulty accounting technique or "loose" figures in a factory establish a cost price of twenty dollars when the actual cost is ten, the company will soon be priced out of the market and swallowed up by its competitors. If, on the other hand, a cost of ten dollars is established when the actual cost is twenty, the company will soon be without funds and will be forced to liquidate.

When operating management's pay check can be radically affected by attention to paper work and cost controls in relation to production methods and savings, supervisors are going to make every effort to understand such figures and cooperate with the cost accountant and company engineers in every way possible to help produce cost figures, production and inventory data, labor figures, burden expense detail, and all other data that must be accurate if top management is to have figures, graphs, and charts to plan the course of industry.

Some Prerequisites of A Workable Profit Sharing Plan

Top management must consider carefully how big a share of profits shop management is entitled to have. It cannot be so large as to swallow up all the profits nor can it be so small that it will appear "niggardly" to the participants. Further study must be given to what share should go to productive supervision and to nonproductive supervision. This must be tied into the potential possibilities each group has to produce profits for a company.

The length of a profit sharing period before distribution of profits also is of importance. At any rate profit sharing arrangements must be tied into accounting periods and physical inventory taking so that actual costs can be used to establish the amount of profit available. The longer the period, the more stable the plan can be for the company. On the other hand, the longer the period, the less immediate incentive there is for shop management to relentlessly pursue the course of greater volume at lower cost. A happy medium must be found. In determining amounts to be paid the plan must be developed so as to fit into the cost and accounting structure, with the result that the profit sharing amounts can be exactly determined without a great deal of extra

clerical effort or the necessity of maintaining complicated additional reports or data that have no bearing on anything else.

A profit plan must be set up so that shop management will not go "overboard" in the quest for profits and upset workers or basic concepts of wage policies, personnel policies, safety policies, or other normal elements in operations. Neither must such a plan cause a shop supervisor to disregard needed maintenance jobs or repair work in his department. The plan must be constructed so that those members of management who are vitally concerned with the system will understand the philosophy of its development and purpose. These same people must understand the basic way in which the system is "worked" so that they will comprehend figures comprising the profit or loss statement as it affects their work. They must be able to understand enough of the fundamentals so that they will comprehend the apportionment of the profits, if any.

Case Study of Company X

Outline of the Company's Standard Cost System

In the case study of which the remainder of this article consists, we will try to fill in the particulars of a profit sharing plan meeting the specifications which have been given. Company X uses a standard cost system. It has all departments set up in burden centers. Four of these departments (converting, shaping, machining, and finishing) are productive departments. A partial chart of inventory and cost accounts is supplied in Exhibit 1.

Company X

Inventory and Cost Accounts

Name	*Symbol*	*Inventory account*	*Burden center*
Raw stores	R-1	2901	201
Semifinished stores	R-2	2902	202
Power services	A-1		103
Maintenance services	A-2		104
Converting	B-1	3901	306
Shaping	B-2	3902	307
Machining	B-3	3903	308
Finishing	B-4	3904	309
Methods	D-1		101
Costs	D-2		102
Finished goods	F-1	4901	402
Shipping	S-1		403

Exhibit 1

The company manufactures many types of products. Materials are requisitioned from raw stores by the converting department. Some products then may go through shaping, machining, and finishing. Others may be routed from converting to semifinished stores, then go directly to finishing. Good pieces produced are delivered to the next department in the production line or to semifinished stores and ultimately to finished goods at a standard price set by cost sheets—using process operations devised by the methods department and costed with standard piece rates on file in the cost department, plus standard burden rates and standard material costs.

Variances are taken on all operations not standard and the in process inventory accounts show on the debit side the actual labor rates paid which are practically the same as *standard*, the earned burden at *standard* and the material priced at *standard*. The credit side of the inventory account shows the credits for production moving out of each department at *standard* as developed in the standard cost sheets. Burden centers are charged with actual costs and credited with the standard amount of burden earned which, as stated above, is charged to the inventory accounts of the production departments.

Each productive department is an independent operating unit controlled by the superintendent. He orders materials for processing at standard cost shown on the cost sheets. He controls his labor, orders his own supplies, repairs, and maintenance work, etc. His department receives credit for all good pieces moving out of the department.

General Setup of the Profit Sharing Plan

When consideration was given to a profit sharing system, it was found that the cost structure, data, and reports would yield all necessary information, with little additional work necessary to compile the actual profit sharing report.

Profit to be shared was based on manufacturing profits only. It was decided that production supervision would receive a share of the profits in their respective departments, interpreted as production savings in comparison with standard costs, up to twenty per cent of their base salaries but not more than twenty per cent of such savings, every three months when plant inventories were taken. In addition, if the plant made a manufacturing profit,

these same people were made participants in the plant profit up to fifteen per cent of their salaries, making it possible for plant production supervision to aim at thirty-five per cent of their pay as a profit sharing maximum. Nonproductive supervision was scheduled to receive up to twenty per cent of their respective salaries if sufficient funds were available in the plant-wide profits.

Production department profits or losses were figured first and then departmental sharing amounts computed on this base were charged against the plant before plant profits available for distribution were calculated. In computing this latter distribution, ten per cent of the plant profit was designated as an over-all upward limit for distribution to the productive and nonproductive supervision of the plant. In making the quarterly payments, the departmental savings, comparing actual with standard costs of production for the period, were marked for division among the department supervisors in proportion to salaries up to the stated limit of the lower of twenty per cent of the savings or of salary. Distribution of plant profit (up to fifteen per cent of base salary for productive department supervision and twenty per cent for nonproductive department supervision) was prescribed to be divided, as between the productive and nonproductive supervisory personnel in proportion to total salaries of each class, whenever maximum distribution could not be made.

Certain departments were eliminated from participation in the profits. Power services and shipping were eliminated because it was felt that due to the peculiarities of X Company's business and setup, the efforts of individuals in these departments could contribute very little to additional profits. The cost division was eliminated because, while it contributed largely to this plan, it also compiled the statistics and figures to show the profits and payments. It was thought that this might at some time or other give ulterior motives. Salaries of all salaried supervision not participating in the plan were reconsidered and reevaluated in order to be sure that all recognition possible was given to individuals not included in the plan.

Figuring Departmental Cost Savings

Exhibit 2 shows figures underlying the computation of converting department cost savings. In general it may be followed quite readily from the outline of the operation of the company's

COMPANY X

DEPARTMENTAL COST SAVINGS COMPUTATION

Period: October, November, and December, 1948

Converting Department	Dept. Symbol B-1		Burden Center 306
	Actual	*Standard*	*Variance*
Raw material	$ 71,352.45		
Manufacturing material	23,000.88		
Inventory decrease	454.64		
Material cost	$ 94,807.97	$ 97,703.03	$2,895.06
Direct labor	$ 8,965.26		
Inventory increase	41.87*		
Labor cost	$ 8,923.39	$ 8,239.36	$ 684.03*
Controllable burden	*(Spent)*	*(Allowed)*	
Indirect labor—clerks	$ 731.00	$ 712.71	
Indirect labor—others	6,263.57	9,608.75	
Liability insurance	57.66	56.84	
Unemployment	235.70	242.24	
Old age benefit	181.30	187.03	
Gas	3,575.84	3,561.87	
Supplies	442.21	514.96	
Repairs to machinery and equipment	4,752.44	3,194.41	
Repairs to tools and dies		20.60	
Freight and express	38.30	342.76	
Perishable tools	2,076.40	1,742.62	
Office expense	23.58	43.66	
	$ 18,378.00	$ 20,228.45	
Inventory increase	102.56*		
Burden cost	$ 18,275.44	$ 20,228.45	$1,953.01
Controllable cost total	$122,006.80	$126,170.84	$4,164.04

* Denotes red figure.

EXHIBIT 2

cost accounts previously given. The actual material and labor charges are accumulated from detail of vouchers charged into inventory account 3901. The controllable burden actual figures applicable to burden center 306 are drawn off the burden ledger. The totals in all three categories must be adjusted by the difference in inventories (fixed charges eliminated) at the beginning and end of the period involved if they are to be comparable with standard cost of completed production for the period. The standard column is the amount shown on the vouchers as production credit for the department. A detail of the burden elements actually spent is compared with the standard allowance. The allowed column is figured by taking the standard labor and multi-

plying it by the individual allowable percentages as figured for budget control on burden items. The total of these percentages equals the *controllable* portion of the standard burden percentages used to figure earned burden and burden on cost sheets.

On the figures given, the converting department made a profit on material. This was due to the fact that they spoiled less than the standard allowed on the cost sheets. In addition, some rejects were reworked and made good. To save on material, extra labor was entailed so the department "lost" $684.03 on labor to make $2,895.06 on material. The sources of burden savings are evident in the detailed analysis at the bottom of Exhibit 2.

Exhibit 3 shows how the departmental gain arrived at in Exhibit 2 is distributed to individual supervisors in the converting department. To figure the share of individuals, $832.81 was divided by $5,300 to secure a factor by which individual salaries were multiplied. Thus each individual shares in the proportion which his salary bears to the total salaries of all supervisors involved. If it had not violated the twenty per cent of gain maximum to pay the supervisors in the department the twenty per cent of salary maximum, the amounts to be distributed could have been obtained by applying this percentage to each salary.

COMPANY X

COST SAVINGS DISTRIBUTION

Converting Department — October, November, and December, 1948

Gain per savings computation	*20% of gain*	*Supervisory payroll*	*20% of payroll*	*Payment allowed*
$4,164.04	$832.81	$5,300.00	$1,060.00	$832.81

Supervisor	*Salary*	*Share in profit*
J. Gould, Superintendent	$2,000	$314.27
H. Eames, Foreman	1,700	267.13
L. Jachs, Foreman	1,600	251.41
	$5,300	$832.81

EXHIBIT 3

Over-All Plant Profit Shares

In Exhibit 4 the plant profit distribution is illustrated on the basis of figures provided by the regular manufacturing statement of the company. Whatever adjustments are necessary are made

to reflect the net adjustment for the period involved. It will be noted that the money paid out cannot equal more than the payroll limits. Therefore only $8,730 can be distributed instead of $8,798.95, the full ten per cent figure.

COMPANY X

PLANT PROFIT SHARING COMPUTATION

Period: October, November, and December, 1948

Total profit for year as shown on December statement	$185,000.00
Less profits for first nine months	97,010.50
Net manufacturing profit for period	$ 87,989.50
Ten per cent distribution limit	$ 8,798.95

	Supervision payroll	*Per cent payroll*	*Payroll limits*	*Per cent*	*Profit apportionment*
Productive departments	$34,200.00	15%	$5,130.00	58.8	$5,173.78
Nonproductive departments	18,000.00	20%	3,600.00	41.2	3,625.17
	$52,200.00		$8,730.00	100.0	$8,798.95

EXHIBIT 4

Since the payroll limit was reached, the distribution as between productive and nonproductive supervisors and among supervisors in these categories is simply a matter of applying fifteen per cent to the productive salary amounts involved and twenty per cent to the nonproductive salary amounts. Had the figure of $8,798.95 fallen below the salary limits, the distribution would have been (between productive and nonproductive supervisors) in the 58.8 per cent to 41.2 per cent ratio—and resulting figures—shown on Exhibit 4 and (within these two separate categories) would have been calculated on individual salaries by applying the ratio which the total distribution to each class of supervisors bears to aggregate salaries in each class.

To take again for a specific example the converting department and its supervisors already named—with respective salaries shown in Exhibit 3—it may be helpful to show both the departmental savings bonus and the share in plant profit which each receives under the workings of the plan as described. This is done in Exhibit 5. The departmental figures are as in Exhibit 3 and the plant profit bonus figures compute to fifteen per cent on the salary amounts, in conformity with material previously given. It will be noted that, in the aggregate, each of these supervisors

will receive for the period covered by the exhibits profit sharing amounts of 30.7 per cent of base salary in comparison with a possible 35 per cent for supervisors in productive departments, and that this is done without upsetting the base salary schedule.

TOTAL PROFIT SHARES FOR SUPERVISORS OF CONVERTING DEPARTMENT

	Total salary	Departmental production share	Plant profit share	Total share	Per cent of total to salary
J. Gould, Superintendent	$2,000	$314.27	$300.00	$ 614.27	30.7
H. Eames, Foreman	1,700	267.13	255.00	522.13	30.7
L. Jachs, Foreman	1,600	251.41	240.00	491.41	30.7
	$5,300	$832.81	$795.00	$1,627.81	

EXHIBIT 5

More Alert Supervision and Better Cost Control

To Company X this profit sharing plan seems sound and equitable. Department profits vary from period to period and among departments because of the size of the department, the amount of production, and the standard cost value of the goods in different departments. (If the first department spoils an article, the loss is much less than if the final department spoils it.) Foremen feel, however, that when they share in a portion of the *dollar savings* (against standard costs) in their own department they are getting a fair share whether their department is first or last in the production line.

Shop production supervisors also feel that what they do can affect the work in the next department in the production line as well as the plant as a whole. Therefore, they feel that it is no more than right that they have a share in the plant profits and it betters their morale. All kinds of help, labor saving ideas, etc., are passed from department to department. Attempts are made to salvage spoiled material. Nevertheless, if the plant fails to make a profit, but one or more departments "makes a bonus," the respective department supervisors can feel that the effort they expended was not entirely without reward. Nonproductive division heads who can vitally affect the plant profits have a new and revitalized feeling. Efforts are at an all-time high to mend breakdowns speedily and to do the thousand and one things necessary to keep production costs down.

The supervisors who share in the system understand the setup and workings of it very well. They are eager to contact the cost department head with problems that arise, either in reference to paper work or the handling of unusual production orders. As a result, cost figures are becoming more and more accurate and differences between inventory book figures and actual inventory figures are becoming smaller and smaller. Variances from standard are more easily ascertained because the cost accountant is now very close to the problems of the various departments. Money is saved because these manufacturing conditions get immediate action and losses are cut to the bone.

General Acceptance of Sharing Basis

The company feels that this system is sound and workable. The departmental share of profits (actual costs versus standard costs) which is distributed to supervision in productive departments over a period of time has amounted to less than fifteen per cent of the total savings in this category. The distribution of plant profits is, as has been indicated, limited to ten per cent of such profits. On analysis, the total paid out to productive and nonproductive supervision in both the departmental category and the plant category has never been more than thirty per cent of the total manufacturing profit, computed as if these amounts had not been paid. Nevertheless, we have found that the supervisors regard the distribution as equitable because the effect on the earnings of each has been sufficient to represent substantial reward for extra effort.

Company X feels that a real contribution has been made in the right direction as far as their business is concerned. The company feels that in the days ahead, with the stiff competition expected, it will survive and continue to make profits. And that is a necessity with any business today!

POINTS OF VIEW

In cases of continued usage of substitute materials over a period of time, there is a dangerous tendency to consider the substitute as standard. Until the engineering and planning functions specify a formal change in the material standard, the accountant must resist any such tendency. Obviously it is only by emphasizing the cost of material substitutions that this item can be reduced or eliminated. In order to add to this emphasis, the excess cost resulting from substitutions should be shown as a footnote on the internal profit and loss statement. Further breakdown according to lines or products might well be attached to the profit and loss report. (*L. I. Asher, Fort Wayne*)

* * *

The understanding of figures is important because a mere presentation of figures by an accountant would not win for him high place in an organization. He must know the physical activity that goes on in the store, the factory, the meat processing plant . . . all of the physical movements that are reported to him as figures. (J. H. Graflund, Waterloo)

* * *

While I am perhaps overly sensitive on this point, the undiscriminating use of the word "paper" in referring to invoices, receiving reports, work orders, etc., by accountants, denotes to me a lazy mind. As accuracy is still one of our objectives, it would appear that we should emphasize that objective by refusing to use jargon and colloquialisms for accurate and illuminating descriptions and terminology.

* * *

Since there is real pressure against increased prices, what is needed seems to be tax relief rather than any major changes in our accounting concepts. I would suggest that we investigate the practicality of reducing taxable income by allowances for amounts spent for replacement and additions to depreciable property in excess of depreciation taken. "Lifo" has partially solved the problem as it affects by inventories, but perhaps some formula can be developed to reduce taxable income to the extent of reserves set up for shrinkage in inventory values based upon price fluctations of the past. (R. F. Lutz, Hampton Roads)

* * *

LABOR COST CONTROL WITHOUT CLOCK CARDS OR INDIVIDUAL PRODUCTION TIME RECORDS

by C. M. BENSON, Chief Accountant, and
W. H. DONALDSON, Head, Production Cost Analysis Section,
The Upjohn Co., Kalamazoo, Mich.

Job tickets and clock cards alike are dispensed with by the company whose experience in labor cost control is described in this article and indirect labor hours are not separated from total hours in cost control reporting. A simple monthly ratio and comparison sheet, in terms of labor hours, based on assumed employee attendance hours (less absences) and on "completed direct production hours at standard" is illustrated.

A SYSTEM, described below, which eliminates the need for individual or group time cards has been working very successfully for several years in our plant, in which there are approximately 1,000 production division employees who produce approximately 1,000 different products with a total of over 2,000 package sizes.

Elimination of Steps Formerly Required

The previous time-keeping methods included employee time or clock cards which were used to compute payroll. In addition, for costing production, there were production time records for both machine and operator hours. Production time for each lot of product was recorded for control purposes so that good and poor performance could be studied for correction and improvement. Actual lot costs for production, labor, and overhead were also computed by applying labor and overhead rates to the accumulated machine and/or operator hours.

To reduce clerical work in costing and in connection with installation of complete standard costs for raw materials and finished goods, standards were instituted for production hours and this eliminated the repeated costing of machine and operator hours to determine labor and overhead cost chargeable to individual lots of product. The production time reports were continued and compared with the standards set. Some time later studies indicated that the elimination of production time cards would also reduce

CONSOLIDATED TIME REPORT

OPERATOR HOURS

Cycle No.

Dept.	Month Ending December 31, 1948						Month Ending December 31, 1947						Part 12 Months Ending December 31, 1948					Year 1947				
	TOTAL PAYROLL HOURS	HOURS LOST ABSENCE		COMPLETED DIRECT PROD. HOURS AT STANDARD		OVER-TIME	TOTAL PAYROLL HOURS	HOURS LOST ABSENCE		COMPLETED DIRECT PROD. HOURS AT STANDARD		OVER-TIME	TOTAL PAYROLL HOURS	HOURS LOST ABSENCE		COMPLETED DIRECT PROD. HOURS AT STANDARD		OVER-TIME	TOTAL HOURS PAYROLL	HOURS LOST ABSENCE		COMPLETED DIRECT PROD. HOURS AT STANDARD		OVER-TIME
		HOURS	PER CENT	HOURS	PERCENT	HOURS		HOURS	PER CENT	HOURS	PERCENT	HOURS		HOURS	PER CENT	HOURS	PERCENT	HOURS		HOURS	PER CENT	HOURS	PERCENT	HOURS
21-1 21-2 21-3 21-4 21 Gen.	12,712	388	3.05	6,666	47.72	-	10,959	323	2.95	5,083	46.38	22	141,348	4,976	3.33	63,651	45.10	531	129,886	4,475	3.58	58,213	46.61	479
26-1 26-2 26-3 26-4 26 Gen.	972	46	4.12	744	76.54	-	815	6	0.74	529	64.91	1	12,699	362	2.85	8,766	69.03	7	10,503	219	2.09	7,159	69.11	2
27-1 27-2 27 Gen.																								
31																								
32	10,988	257	2.35	7,399	67.74	70	12,168	487	3.43	7,223	59.36	207	129,917	4,737	3.65	78,598	60.5	2,450	144,727	6,591	4.55	85,912	59.36	3,357
34-1 34-2 34-3 34-4 34 Gen.																								
39-2 39-4 39 Gen.																								
40																								
55																								
55-1																								
Total																								

EXHIBIT 1

clerical effort and, at the same time, increase time available for production. In order to check proper utilization for operator hours, departmental summary time reports were prepared on the basis of standard hours times production rather than actual time.

Mechanics of Present Control Procedure

As a result, we now have a system of labor cost control in the factory which has a number of distinctive features. In the first place, there are no time clocks. Each employee enters elapsed regular hours and overtime hours daily on a payroll time card without recording time in or out. If the regular hours each day of a week are worked, the employee merely inserts an eight in the spaces provided. This leaves it squarely up to supervision to see that employees are not habitually late. It also lets the employee know that he is trusted and it has been our experience that the employee appreciates this and reciprocates by fair conduct. The principal labor control device is a monthly Consolidated Time Report (Exhibit 1) comparing for each department aggregate standard time allowances for all operations performed (set from experience at first and gradually converted to standards by competent time and motion study personnel) with aggregate payroll hours. The report consists of simplified data for the current month and comparable data for the same month a year ago, year to date, and previous calendar year. In each case, the information, in columnar form, consists of: total payroll hours, hours lost through absence with percentage relationship to total hours, completed production hours at standard with percentage relationship to total hours, and overtime hours.

Total payroll hours are obtained by extending the number of employees by eight hours per day times number of days worked per month. Overtime payroll hours are added to the above figure. In our accounting or other records no segregation is made between direct and indirect labor. This is another simplification and our experience indicates it does not vitiate control. Because of this, the total payroll hours include both direct and indirect labor. Hours lost through absence are obtained from absence records for each department. The percentage computation is made in order to determine what relationship absence hours bears to total payroll hours.

Since no record of actual production hours worked on each lot of goods is maintained, the completed direct production hours for each department are obtained as follows:

Product	*Standard time per lot*	*Number of lots completed during month*	*Total standard production hours*
A	13.0 hrs.	6	78.0
B	11.5 hrs.	8	92.0
C	9.0 hrs.	1	9.0
D	26.0 hrs.	3	78.0
		Total direct production hours at standard	257.0

The percentage computation is now made in order to determine what percentage direct production hours at standard is of total payroll hours. Overtime hours are obtained from payroll records in each department.

Exercise of Control

In order to illustrate the type of control exercised through the use of the Consolidated Time Report, it may help to analyze briefly the sample information shown on Exhibit 1 for three representative departments. For Department 21-3, the year 1948 shows an operating efficiency rating of 45.10 per cent as compared to 46.61 per cent for the year 1947. From experience we know that this range is normal for this department. There were no changes in the method of manufacture not covered by standard time revisions. The percentage of absent time remained substantially unchanged as did overtime hours. Our conclusion is that operation of the department was at normal efficiency in 1948. The comparative monthly figures (December 1948 vs. 1947) showed no unusual variances requiring analysis.

Using the same method of analysis, it would also seem that the efficiency of operation of Department 26-1 for the year 1948 was normal. In the case of this department, the monthly figures comparing December 1948 to December 1947 indicates some variation in operation. Completed production hours at standard equaled 76.54 per cent of payroll hours as compared to 64.91 per cent in December 1947 and a normal yearly average of 69 per cent. It was readily ascertained that there had been a carry-over of production from the previous month the credit for which was obtained in December. Absent hours are 4.12 per cent of payroll hours as compared to 0.74 per cent for the same month last year. Experience has shown us that month-to-month variances in operating fig-

ures for small departments, such as Department 26-1, are greater than is the case with a larger department. They are all, however, easily explainable or investigated.

In Department 33, our attention is immediately focused on the fact that for December 1948 completed production hours equaled 67.74 per cent of payroll hours as compared to 59.36 per cent for the year 1947 and 60.5 per cent for the year 1948. A small part of the increase in productive efficiency is accounted for by the fact that absent hours decreased from 4.55 per cent in 1947 to 2.35 per cent in December 1948. Further analysis showed that in December there had been a number of improvements in manufacturing methods which were not reflected in revised standard times. Thus production operators were constantly beating the standards in effect. A methods study is now being conducted in this department which will result in changed unit standard hours. This will in turn bring the per cent of operating efficiency (production hours to payroll hours) back to approximately 59.0 per cent which experience indicates is normal.

Advantages of the System

We have found our present methods to have a number of outstanding advantages. Among these are:

1. Time is not wasted by production personnel punching in and out on plant or job clock cards.

2. The clerical effort formerly expended computing actual hours, standard hours, and variation from standard on each work ticket is completely eliminated.

3. Previous efforts to determine actual hour performances versus the standard hour performance of each operator have ceased. It is our feeling that the foreman is in the best position to determine the relative value or efficiency of the operators working for him. His judgment is quickly reflected in the consolidated time report.

In summary, we have eliminated a large volume of detailed and relatively valueless record-keeping and, at the same time, have retained a close control over labor cost of our manufacturing operations.